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EXAMINER

MILLER, PATRICK L

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,517

Applicant(s)

BRUZY ET AL.

Examiner

Patrick Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 16 April 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 04/16/03 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Response to Arguments

2. Applicant's arguments, see page 8 and page 9, lines 1-7 of the amendment, filed on 04/16/03, with respect to the rejection(s) of claim(s) 1 under USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Watson (6,414,455).
3. Applicant's arguments with respect to claims 3 and 6-8 have been considered but are moot in view of the new ground(s) of rejection.
 - New reference to Watson (6,414,45).
4. Applicant's arguments, see pages 9 and 10, filed 04/16/03, with respect to claim 4 have been fully considered and are persuasive. The rejection of claim 4 has been withdrawn.
5. With respect to claims 2 and 5 (page 11, lines 1-7), the Applicant's arguments filed 04/16/03 have been fully considered but they are not persuasive.
 - The Examiner believes the motivation to use the Bartel reference is disclosed. Namely, because the stepper motor is not permanently energized (i.e. energized by pulses) (Col. 2, lines 37-50). This provides the advantage of allowing for transient surges.

Claim Objections

6. Claims 7 and 8 are objected to because of the following informalities: Claims 7 and 8 cite "a means" (claim 7: line 6 of claim; claim 8: lines 2 and 3 of claim). It is unclear if these means are the same as that cited in claim 7 (line 4 of claim). Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno (6,073,689) in view of Watson (6,414,455) and Uchinami (JP 08051795).
- Mizuno discloses a method and means for controlling a stepper motor that actuates a motor-vehicle air-conditioning system (Col. 1, lines 4-10), the method comprises the steps of: actuating the stepper motor and delivering power at a drive frequency to the stepper motor in response to an actuation command (Cols. 6/7, lines 55-67/1-2), a power supply circuit and voltage (implied); a control input and control unit (Fig. 1, #26); and the installation includes at least one actuator (claim 9).
 - Mizuno does not disclose continuously gathering torque requirements, the means supplying the control unit with torque requirements, reducing the drive frequency when an increase in torque is needed, increasing the drive frequency when a decrease in torque is needed, performing said drive frequency increasing and decreasing when the drive

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frequency is below a predetermined maximum frequency, varying drive frequency in a near-continuous way (claim 3), the torque requirements are based on instantaneous torque (claim 6), and first a second torque thresholds (claim 7).

- Watson discloses the method and means for continuously gather torque requirements (Sampled actual torque, Tactual); supplying the control unit with torque requirements (Fig. 2, signal 101 to #15); reducing the drive frequency when more torque is needed and increasing the drive frequency when less torque is needed (Col. 12, lines 17-33); the frequency changes in a near continuous way (Fig. 6), the torque requirements are based on instantaneous torque (torque based on instantaneous signals #101, #103 in Fig. 2); and reducing the drive frequency when the torque requirement exceeds a first threshold and increasing the drive frequency if the torque requirement becomes lower than a second threshold (Fig. 8C, Tmax and Tmin; Cols. 13/14, lines 55-67/1-29). The motivation for such is to provide the advantage of controlling the motor in a "constant torque" mode (Col. 2, lines 41-56).
- Uchinami discloses a driving frequency upper limit (maximum frequency) that is based on output torque. Uchinami teaches controlling a stepper motor below a maximum frequency. The motivation to do such is to provide the advantage of rapidly controlling the motor and preventing a step-out condition (Abstract).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to control the drive frequency for the stepper motor of Mizuno, based on torque requirements as disclosed above, thereby providing the advantage of controlling the motor in a constant torque mode, as taught by Watson. Also, it would have been

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obvious to one having ordinary skill in the art at the time of the invention that the driving frequency for the stepper motor of Mizuno would be controlled below a driving frequency upper limit, thereby providing the advantage of providing rapid control and preventing a step-out condition, as taught by Uchinami.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno, Watson, and Uchinami as applied to claim 1 above, and further in view of Boillat (4,791,345).

- Mizuno, Watson, and Uchinami do not disclose initially driving the stepper motor to the maximum frequency.
- Boillat discloses initially increasing the drive frequency of a stepper motor until the frequency reaches a maximum drive frequency limit (Col. 6, lines 52-54). The motivation to increase the drive frequency to a maximum drive frequency limit at initialization is to provide a steady and continuous increase in drive frequency, and the limit is provided to keep the torque from decreasing too much (Col. 6, lines 43-51). Since the initial drive frequency increase is smooth and the maximum drive frequency is limited, this provides the advantage of preventing the motor from vibrating and also eliminates noise.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno, Watson, and Uchinami so that upon initialization, the drive frequency proceeds to a maximum drive frequency and the drive frequency may not be increased above the maximum drive frequency limit, thereby providing the advantage of reduced motor vibration and noise, as taught by Boillat.

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9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno, Watson, and Uchinami as applied to claim 1 above, and further in view of Bartel (5,762,384).

- Mizuno, Watson, and Uchinami teach all of the limitations of claim 1, but with respect to claim 5 do not disclose the motor fed in an over-powered mode.
- Bartel discloses a stepper motor that uses a drive power larger than the rated power of the motor, thus making the stepper motor fed in an over-powered mode. Bartel's motivation for driving the stepper motor in an over-powered mode is because the stepper motor is not permanently energized (i.e. energized by pulses) (Col. 2, lines 37-50). This provides the advantage of allowing for transient surges.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Mizuno, Watson, and Uchinami so that it is fed in an over-powered mode, thereby providing the advantage of allowing for transient surges, as taught by Bartel.

Allowable Subject Matter

10. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claim 4, the Prior Art does not disclose or suggest modifying the device of Mizuno, Watson, and Uchinami so the drive frequency is varied in steps based on a torque threshold.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 703-308-4931. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 703-308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Patrick Miller
Examiner
Art Unit 2837

pm
June 27, 2003


ROBERT E. NAPPI
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